

The opinion in support of the decision being entered today is *not* binding
precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte STEPHEN FRANCIS RUTKOWSKI,
CANAN USLU HARWICKE,
MICHAEL FRANCIS XAVIER GIGLIOTTI and
MELVIN ROBERT JACKSON

Appeal 2007-2909
Application 10/622,063¹
Technology Center 1700

Decided: 12 September 2007

Before JAMESON LEE, RICHARD TORCZON, and SALLY C. MEDLEY,
Administrative Patent Judges.

MEDLEY, *Administrative Patent Judge.*

DECISION ON APPEAL

1 **A. Statement of the Case**

2 Applicants appeal under 35 U.S.C. § 134 from a final rejection of
3 claims 1-3, 11 and 24. We have jurisdiction under 35 U.S.C. § 6(b).

1 Application for patent filed 17 July 2003. The real party in interest is
General Electric Company.

The prior art relied upon by the Examiner in rejecting the claims on appeal is:

3	Ishida	US 5,932,012	Aug. 3, 1999
4	Chikahisa	WO 99/49987	Oct. 7, 1999
5	Barrey	US 6,197,115	Mar. 6, 2001
6	Chikahisa	US 6,562,406	May 13, 2003

8 Claims 1-3, 11 and 24 stand rejected under 35 U.S.C. § 103(a) as
9 being unpatentable over Ishida in view of Barrey and either Chikahisa (US
10 6,562,406) or Chikahisa (WO99/49987) (Final Rejection 2 and Answer 4²).

11 BACKGROUND

The invention is related to a robotic pen for writing a material atop a workpiece. The workpiece is mounted on top of a stage for rotation and orthogonal translation. The stage permits translation generally in a plane and rotation about an axis generally parallel to the plane. Specifically, the workpiece may be translated in a first linear axis X and a second linear axis Y for a two-plane translation of the workpiece (Specification ¶ 0018). A spindle 32 is mounted on the stage for rotation of the workpiece about an axis A, which is parallel to the two-plane X-Y axes (Specification ¶¶ 0019, 0052-0053 and Figs. 1 and 2). A controller coordinates the movement of the pen tip and the stage to dispense the material from the pen tip to the workpiece.

2 Claims 4-6, 12, 17-23, 25, and 26 have been objected to as being dependent upon a rejected claim, but indicated allowable if rewritten in independent form (Final Rejection 5 and Answer 2).

1 **B. Issue**

2 The issue is whether Applicants have shown that the Examiner erred in
3 determining claims 1-3, 11 and 24 to be unpatentable over the prior art as
4 applied by the Examiner.

5 **C. Findings of fact (“FF”)**

6 The record supports the following findings of fact as well as any other
7 findings of fact set forth in this opinion by at least a preponderance of the
8 evidence.

9 1. Applicants’ claims 1-3, 11 and 24 are the subject of this appeal.

10 2. Independent claims 1, 11 and 24 are reproduced as follows:

11 1. A robotic pen comprising:

12 a machine including a stage for mounting a workpiece for
13 rotation and orthogonal translation, the said stage permitting
14 translation generally in a plane and rotation about an axis generally
15 parallel to said plane, and an elevator for translation from said stage;

16 a pen tip rotatably mounted to said elevator;

17 a dispenser joined in flow communication with said pen tip for
18 ejecting a stream of material atop said workpiece; and

19 a digital controller configured for coordinating relative
20 movement of said pen tip and said stage, and dispensing of said stream
21 from said pen tip.

22 11. A robotic pen comprising:

1 a computer numerically controlled machine including a stage for
2 mounting a workpiece for rotation and orthogonal translation, the said
3 stage permitting translation generally in a plane and rotation about an
4 axis generally parallel to said plane, and an elevator for translation
5 from said stage;

6 a pen tip rotatably mounted to said elevator;

7 a dispenser joined in flow communication with said pen tip for
8 ejecting a stream of material atop said workpiece.

9 24. A robotic pen comprising:

10 a machine including a stage for mounting a workpiece for
11 rotation and orthogonal translation, the said stage permitting
12 translation generally in a plane and rotation about an axis generally
13 parallel to said plane, and an elevator for translation from said stage;

14 a pen tip rotatably mounted to said elevator for rotation about an
15 axis generally parallel to said plane;

16 a dispenser joined in flow communication with said pen tip for
17 ejecting a stream of material atop said workpiece; and

18 a digital controller configured for coordinating relative
19 movement of said pen tip and said stage, and dispensing of said stream
20 from said pen tip.

21 Ishida

22 3. The Examiner found that Ishida describes (Fig. 1) a stage (items 5,
23 6, and 8), an elevator (items 4a and 10), a pen tip (nozzle 1), a dispenser

1 (syringe 2 and nozzle support 12) and a digital controller (items 14, 16, 17
2 and 18) (Final Rejection 2 and Answer 4).

3 4. The Examiner found that Ishida does not describe that the pen is
4 rotatably mounted to the elevator, or that the stage permits translation
5 generally in a plane and rotation about an axis generally parallel to the plane
6 as recited in the claims (Final Rejection 2 and Answer 4).

7 Barrey

8 5. The Examiner relied on Barrey as describing an end effector
9 gripping tool 16 for permitting translation generally in a plane and rotation
10 about an axis generally parallel to the plane as claimed (Final Rejection 3-4
11 and Answer 4 and 6).

12 6. Specifically, the Examiner found that Barrey describes a multi-axis
13 robot structure that allows for the application of sealant to a surface that lies
14 in two or more dimensional planes, directing attention to Barrey, col. 2, lines
15 54-57 (Final Rejection 3 and Answer 4).

16 7. Barrey describes the following:

17 As will be discussed in greater detail below, six of the seven
18 axial control ports associated with robot controller 18 are used
19 for controlling the six axes of motion of the robotic manipulator
20 14. Thus, in the present implementation, all six axes of motion
21 provided by the robotic manipulator 14 are utilized so that the
22 end effector or gripping tool 16 has a complete range of motion
23 within a three-dimensional coordinate space. As will be
24 appreciated, this complete range of motion becomes important
25 when applying sealant to surfaces which lie in two or more
26 dimensional planes, and a smooth and consistent robotic motion
27 is required. (Barrey 2:47-57).

1 8. The Examiner concluded that it would have been obvious to use the
2 robot end effector gripping tool (stage) 16 in Barrey for the X-Y table of
3 Ishida in order to apply sealant to a surface that lies in two or more
4 dimensional planes (Final Rejection 3 and Answer 4).

5 Chikahisa (either the US or WO)

6 9. The Examiner relied on either of the Chikahisa US patent or WO
7 publication (collectively, Chikahisa) as describing a pen that is rotatably
8 mounted to an elevator (Final Rejection 3 and Answer 5).

9 10. Specifically, the Examiner found that Chikahisa discloses a
10 syringe and nozzle applying device with a member rotating device (item 230)
11 to rotate the nozzles for application (Final Rejection 3 and Answer 5).

12 11. The Examiner concluded that it would have been obvious to use
13 the Chikahisa rotary mount to achieve better control over nozzle positioning
14 shifts during dispensing (Final Rejection 3 and Answer 5).

15 Applicants' Arguments

16 12. Applicants do not dispute the Examiner's findings with respect to
17 Ishida and Chikahisa.

18 13. Applicants dispute, however, that Barrey describes that the robotic
19 manipulator is rotatable about an axis generally parallel to the translational
20 plane as found by the Examiner (Br. 6-10).

21

22

1 The Examiner's Response

2 14. The Examiner argued that Barrey describes a six axis robot and
3 that such a robot is inherently capable of permitting translation in a plane and
4 rotation about an axis generally parallel to a plane, citing as examples of such
5 robots to be found in US Patents 6,039,375; 5,890,656; 5,833,147; 5,777,267
6 (Answer 7-8).

7 15. The Examiner further argued that the Barrey end effector must be
8 able to rotate in order to manipulate the tool as described, e.g., in three
9 dimensions, and in order to maintain the substrate in proper relationship to
10 the stationary dispenser (Answer 8).

11 **D. Principles of Law**

12 A claimed invention is not patentable if the subject matter of the
13 claimed invention would have been obvious to a person having ordinary skill
14 in the art. 35 U.S.C. § 103(a); *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727,
15 82 USPQ2d 1385 (2007); *Graham v. John Deere Co. of Kansas City*, 383
16 U.S. 1 (1966).

17 Facts relevant to a determination of obviousness include (1) the scope
18 and content of the prior art, (2) any differences between the claimed
19 invention and the prior art, (3) the level of skill in the art and (4) any relevant
20 objective evidence of obviousness or non-obviousness. *KSR*, 82 USPQ2d at
21 1388, *Graham*, 383 U.S. at 17-18.

1 **E. Analysis**

2 The Examiner finally rejected claims 1-3, 11 and 24 under 35 U.S.C.
3 § 103(a) as being unpatentable over Ishida in view of Barrey and either
4 Chikahisa (US 6,562,406) or Chikahisa (WO99/49987) (collectively referred
5 to as “Chikahisa”). Applicants argue claims 1-3, 11 and 24 together as a
6 group (Br. 6 and 10).

7 Applicants do not dispute the Examiner’s findings with respect to what
8 Ishida and Chikahisa describe. Applicants’ argue, however, that Barrey does
9 not describe that the robotic manipulator is rotatable about an axis generally
10 parallel to the translational plane as found by the Examiner (FFs 12-13).

11 Independent claims 1, 11, and 24 recite a machine including a stage for
12 mounting a workpiece for rotation and orthogonal translation. The stage
13 permits translation, e.g., movement, generally in a plane and “rotation about
14 an axis *generally parallel to said plane*” (emphasis added). This is seen, for
15 example, in the Specification Figs. 1 and 2, where the plane of translation is
16 defined as a first linear axis X and a second linear axis Y for a two-plane
17 translation of the workpiece on the stage 18 (Specification ¶ 0018). A
18 spindle 32 is mounted on the stage for rotation of the workpiece about an axis
19 A, which is parallel to the two-plane X-Y axes (Specification ¶¶ 0019, 0052-
20 0053 and Figs. 1 and 2). Thus, the spindle 32 allows rotation of the
21 workpiece about an axis A which lies along a different plane than the X-Y
22 plane, but one that is generally parallel to the X-Y plane.

1 The Examiner found that Barrey describes a stage, e.g., end effector
2 gripping tool 16, which permits translation generally in a plane. The
3 Examiner did not specifically find where Barrey describes rotation about an
4 axis that is parallel to the plane defined by the end effector. Rather, the
5 Examiner has taken the position that since Barrey describes a six axis robot,
6 that such robot inherently is capable of being moved in any direction and
7 would be capable of rotating about an axis that is parallel to the plane defined
8 by the end effector gripping tool 16. The Examiner directs our attention to
9 several patents to support the assertion that a six axis robot is capable of
10 being moved in any direction (FFs 5-7 and 14-15).

11 The Examiner has failed to demonstrate that the Barrey end effector
12 permits translation generally in a plane and rotation about an axis *generally*
13 *parallel to the plane*. We understand the Examiner to rely on the end effector
14 gripping tool 16 as defining the plane of translation. That is, the end effector
15 gripping tool 16 defines a plane of translation in at least, for example, the Y
16 direction to move or translate the workpiece in towards pen 40. Even if the
17 Examiner is correct that the end effector gripping tool 16 inherently is
18 capable of being rotated in any direction, such rotation would be about an
19 axis in *the same plane* of, and not in a plane that *is generally parallel to*, the
20 plane defined by the end effector gripping tool. We read “generally parallel
21 to” as excluding “the same as.” Also, in the context of the claimed invention,
22 the translational motion plane is independent of rotational motion.
23 Therefore, the Examiner has failed to sufficiently establish that Barrey

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1 describes a stage which permits translation generally in a plane and “rotation
2 about an axis generally parallel to” the plane as recited in independent claims
3 1, 11 and 24. As applied by the Examiner, neither Ishida nor Chikahisa make
4 up for the deficiencies of Barrey. The Examiner’s rejections are reversed.

5 **E. Decision**

6 Upon consideration of the record, and for the reasons given, the
7 Examiner’s rejections are reversed.

8 The Examiner’s rejection of claims 1-3, 11 and 24 as being
9 unpatentable under 35 U.S.C. § 103(a) over Ishida in view of Barrey and
10 either Chikahisa (US 6,562,406) or Chikahisa (WO99/49987) is reversed.

REVERSED

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